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AUTHOR Darcy, Robert L.
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ABSTRACT

As part of a project designed to identify appropriate and feasible methods of evaluating vocational education, this essay provides a perspective for evaluating vocational education in terms of outcomes. The first of four sections provides a rationale for studying educational outcomes. Section 2 focuses on the nature and meaning of outcomes and the range and diversity of vocational education outcomes, and outlines an approach to outcomes evaluation within the general framework of vocational education evaluation. In addition, this section provides a list of thirty questions concerning possible outcomes of vocational education which illustrates the broad and diverse range of possible outcomes. Among the key issues identified in section 3 in the area of outcomes evaluation were (1) the definition of vocational education; (2) the specification of vocational programs as educational treatments; and (3) sources and uses of evaluative criteria and experimental controls, and the use of comparison groups in evaluating vocational education programs with respect to specified outcomes. The final section suggests an agenda for improving outcome evaluation. (LRA)

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Research and Development Series No. 163

VOCATIONAL EDUCATION OUTCOMES: PERSPECTIVE FOR EVALUATION

Robert L. Darcy

The National Center for Research
in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210

1979

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U S DEPARTMENT OF HEALTH,
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FOREWORD

Educational outcomes have commanded increased attention in recent years as the focus of evaluation has shifted from processes to products and impact. Are vocational education programs achieving their goals? What are the side effects of vocational education? What are the tangible payoffs to individuals and society from resources invested in vocational education?

This essay provides perspective for evaluating vocational education in terms of outcomes. The author clarifies the nature and meaning of outcomes, expands our awareness of the range and diversity of vocational education outcomes, outlines an approach to outcomes evaluation within the general framework of vocational education evaluation, identifies some issues and problems relative to outcomes evaluation, and suggests an agenda for strengthening research and evaluation in the field of vocational education outcomes.

Audiences that may find this publication especially useful include the research, development, and evaluation (RD&E) community in vocational education and training; policy analysts and educational leaders; and some practitioners in state and local education agencies.

Vocational Education Outcomes: Perspective for Evaluation originally appeared under the title "Examining Vocational Education Outcomes: Perspective on the State of the Art," Attachment "C" in Vocational Education Outcomes, Final Report on Year One of the R&D Project "Examining Vocational Educational Outcomes and Their Correlates." The report was prepared at the National Center by Robert L. Darcy, Kathleen A. Bolland, and Joanne Farley with the assistance of Carolyn M. Taylor, and submitted to the U.S. Office of Education in January 1979. Other components of that report will also be published as separate documents with the titles Vocational Education Outcomes: A Thesaurus of Outcome Questions; Vocational Education Outcomes: An Evaluative Bibliography of Empirical Studies; and Vocational Education Outcomes: Annotated Bibliography of Related Literature.

In the development of the general report and its various components, a number of people made valuable contributions. Distinguished representatives from business, labor, and education who served on the National Workshop Panel on Vocational Education Outcomes were: Walter G. Davis, American Federation

of Labor and Congress of Industrial Organizations; Mary Ellen Hillaire, Evergreen State College (Washington); Addison S. Hobbs, Michigan Department of Education (now with the Maryland Department of Education); O. Louise Lothspeich, Oregon State Advisory Council on Vocational Education; Fred D. Mack, Central State University (Oklahoma); Gerald Q. Miller, Sharon Steel Corporation (Pennsylvania) and Employers National Job Service Improvement Committee; Philip L. Smith, The Ohio State University; Jerry C. Olson, Pittsburgh Public Schools (Pennsylvania); Wallis E. Pereira, Industry Education Council of California; Clio S. Reinwald, Arizona Department of Education; Annell L. Simcoe, Rutgers University; and J. Robert Warmbrod, The Ohio State University.

We are also grateful to Michael D. Hock of Worthington, Ohio, Douglas Sjogren of Colorado State University, and Michael Scriven of the University of San Francisco, who served as consultants for the study; to the five members of the National Center's Evaluation Technical Advisory Panel -- Carol B. Aslanian, College Entrance Examination Board; George C. Copa, University of Minnesota; Donald W. Drewes, Conserva Inc.; Ruth P. Hughes, Iowa State University; and Daniel L. Stufflebeam, Western Michigan University -- and to Jo Ann M. Steiger of Steiger, Fink & Kosecoff, and David J. Pucel of the University of Minnesota, as well as T. Lynne Peterson and William L. Hull of the National Center staff, for reviewing drafts of the full report.

On behalf of the National Center, I want to express appreciation to the Bureau of Occupational and Adult Education, U.S. Office of Education, for sponsoring this study and to Robert L. Darcy, Senior Research Specialist at the National Center both for directing the overall project and preparing the present essay.

Robert E. Taylor
Executive Director
The National Center for Research in Vocational Education

VOCATIONAL EDUCATION OUTCOMES: PERSPECTIVE FOR EVALUATION[1]

I. INTRODUCTION

This paper deals with the theory and practice of vocational education outcomes evaluation, which is part of the broader field of educational evaluation. It is not intended as a review and synthesis paper or comprehensive state-of-the-art essay on vocational education evaluation but mainly as a contribution to the conceptual basis of outcomes analysis.

A. Purpose of the Essay

The overall purpose of the essay and the study to which it relates is to help answer two research questions: (1) What particular outcomes are appropriate for use as criteria to evaluate vocational education programs? and (2) What procedures can be used for evaluating vocational programs in terms of these outcomes?

Special attention in this paper is focused on:

--clarifying the nature and meaning of vocational education outcomes;

--expanding awareness of the range and diversity of outcomes;

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[1]This essay was prepared as part of The National Center's applied research and development project, "Examining Vocational Education Outcomes and Their Correlates," under a contract with the Bureau of Occupational and Adult Education, Office of Education, U.S. Department of Health, Education, and Welfare. Other products of this study include an evaluative bibliography of vocational education outcome studies, a thesaurus of vocational education outcome questions, and an annotated bibliography of literature related to vocational education outcomes. The author wishes to express appreciation to John T. Grasso, Michael Scriven, Douglas Sjogren, and Daniel L. Stufflebeam for their review of an earlier draft, and his special thanks to Kathleen A. Bolland, Joanne Farley, Carolyn M. Taylor, and other colleagues at the National Center for their helpful comments and suggestions concerning the paper.

--developing an approach to outcomes evaluation within the general framework of vocational education evaluation;

--identifying some issues, problems, and practices in the evaluation of vocational programs with respect to outcomes; and

--suggesting an agenda for strengthening research and evaluation in the field of vocational education outcomes, which in turn can contribute to improving the effectiveness and efficiency of educational programs.

The present paper does not identify a blue-ribbon list of valid, operational outcomes nor does it lay out a procedure for doing so. Those tasks remain to be accomplished in the future.

The audience addressed by this paper includes educational researchers and evaluators, vocational education policy makers, academics, and the general public. While some of the ideas and information contained in this paper may be directly useful to practitioners, it is not intended as a how-to-do-it handbook for program managers, evaluators, or classroom teachers.[2]

B. Rationale for Studying Educational Outcomes

Outcomes analysis is important to observers of vocational education for at least three very practical reasons. First,

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[2]To help meet the needs of practitioners, the National Center has developed Evaluation Handbook: Guidelines and Practices for Follow-Up Studies of Former Vocational Education Students (Stephen J. Franchak and Janet Weiskott, 1978). The bibliography alluded to in footnote 1 reports on design and procedures that have been used in some empirical outcome studies conducted during the past decade (see Kathleen A. Boland, Vocational Education Outcomes: An Evaluative Bibliography of Empirical Studies; Columbus: National Center for Research in Vocational Education, The Ohio State University, 1979). Another Center project completed in 1978 is Interpreting Outcome Measures in Vocational Education: A Final Report (Floyd L. McKinney, Kenney E. Gray, and Marie Abram). Scheduled for publication by the National Center in 1979 are five state-of-the-art papers dealing with various aspects of evaluation: Needs Assessment for Program Planning in Vocational Education (Information Series No. 154); Longitudinal Methods as Tools for Evaluating Vocational Education (IS No. 155); Use of Evaluative Data by Vocational Education (IS No. 156); Impact Evaluation in Vocational Education: The State of the Art (IS No. 157); and Data Sources for Vocational Education Evaluation (IS No. 158). In addition, the National Institute of Education is producing papers and reports as part of its study and evaluation of vocational education mandated by the Education Amendments of 1976.

the states are mandated by Congress to evaluate program effectiveness on the basis of two specific outcome criteria: (a) employment in training-related occupations, and (b) employer assessment of the training and preparation for employment received by students.[3] Many more outcomes, such as educational achievement and human development, are perceived by educators and others as being of immense importance both to individual students and society. Second, public concern over tax burdens, rising costs of government, and accountability regarding returns from educational spending have led to a search for tangible indicators of program impact. Third, as educational evaluation has developed and matured, study of the broad area of outcomes and impact has assumed increased importance in a comprehensive program of evaluative research alongside such non-outcome variables as institutional context, student characteristics, resources, program goals, and educational processes.

Moreover, these practical considerations are in keeping with the fundamental purposes of scientific inquiry: to discover (1) the consequences of given actions (including programs, policies, and institutional arrangements) and (2) the specific actions that will produce given consequences. In the policy sciences, there is a third function of research, namely to generate information which can help decision makers select the goals that will be treated as desirable "given" consequences and provide evaluators with standards to be used in evaluating observed consequences. In the present context, we are addressing conceptually, a question of "positive analysis"--What are the various possible consequences of vocational education programs? and a question of "normative analysis"--Which of these consequences are appropriate and feasible to be used as criteria for evaluating vocational programs?[4]

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[3]U.S. Public Law 94-482, Education Amendments of 1976, Sec. 112(b).

[4]Nobel prize winner Milton Friedman quotes John Neville Keynes in distinguishing among "positive science," a systemized body of knowledge concerning what is; "normative science," knowledge addressing criteria of what ought to be; and "art," a system of rules for the attainment of a given end. Essays in Positive Economics (Chicago: University of Chicago Press, 1953), p. 3.

II. EDUCATIONAL EVALUATION AND OUTCOMES ANALYSIS

A review of literature in the broad area of evaluation, the narrower field of educational evaluation, and the more specialized field of vocational education evaluation discloses considerable variation in how people view the nature, purpose, and preferred methods of assessment and evaluation.

A. Assessment, Evaluation and Research

In the Encyclopedia of Educational Evaluation, assessment is defined as "the process of gathering data and fashioning them into an interpretable form."[5] Worthen and Sanders in Educational Evaluation: Theory and Practice identify five "schools of thought about how evaluation ought to be defined." As practiced by their respective adherents, these approaches are characterized as: (1) "educational measurement," (2) "professional judgment," (3) "comparing performance data with clearly specified objectives," (4) "collecting information to assist decision-makers in choosing among available decision alternatives," and (5) "systematic collection and analysis of information to determine the worth of a thing." Irrespective of approach, description is acknowledged to be a basic component of the evaluation process.[6] Evaluation is sometimes

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[5]Sometimes the term "assessment" is used interchangeably with "measurement" and with "evaluation." See Scarvia B. Anderson and others, Encyclopedia of Educational Evaluation (San Francisco: Jossey-Bass, 1975) p. 27.

[6]Blaine R. Worthen and James R. Sanders, Educational Evaluation: Theory and Practice (Worthington, Ohio: Charles Jones, 1973), pp. 20f, 109f, 125. In their treatment of description as a component of formal evaluation, Worthen and Sanders focus on the ideas of Robert E. Stake. More recently, writing in the newsletter of The Evaluation Network, Joe B. Hansen emphasizes the importance of description in program evaluation and laments the bias which evaluators display for experimental studies to the neglect of full and accurate description. "With the advent of modern statistical techniques and the wide availability of computers to perform statistical analysis," he writes, "educational research and evaluation have become associated with statistical methodology to the point of eclipsing more fundamental considerations. It could be interpreted by practitioners of this emerging art-science as a sign of insecurity -- (footnote continued on next page)

referred to as evaluative (or evaluation) research. Scriven suggests that "the basic distinction [between 'straight' research and evaluation research] seems to be that evaluation research must produce as a conclusion exactly the kind of statement that social scientists have for years been taught is illegitimate: a judgment of value, worth, or merit."[7] In the present paper we are adopting the Worthen and Sanders/Scriven definition of evaluation as the determination of the worth of a thing. In this view, evaluation involves (a) observation and description of what is, and (b) a value judgment concerning what should be, i.e., appraisal or judgment of worth.

However defined, evaluation has numerous purposes and methods. The former include accountability, compliance, project monitoring, program improvement, and providing useful information for judging decision alternatives such as whether to continue, expand, modify, or terminate programs.[8] Needs assessments are conducted, and both formative and summative evaluations are carried out. The diversity of evaluation methods is suggested by some of the terms one encounters in the literature: goal-based evaluation, goal-free evaluation, formal, informal, objective, subjective, process, on-site, product, follow-up, impact, payoff evaluation, benefit-cost studies, and cost-effectiveness analyses, among others.

This kaleidoscope of concepts, purposes, perceptions, and procedures adds a richness to evaluation that may, however, exact a toll. The other side of the diversity coin in educational evaluation is a lack of consistency, clarity, and

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[6](continued) -- that evaluators are often more concerned with the statistical significance of their results than with the importance of the questions to which the analyses are addressed." See "The Formative-Summative Dichotomy and the Role of Description in Program Evaluation," Evaluation News, No. 6, August 1978, pp. 14-16.

[7]Michael Scriven, "Evaluation Perspectives and Procedures," pp. 3-93 in W. James Popham (ed.) Evaluation in Education (Berkeley: McCutchan, 1974), p. 4.

[8]In Educational Evaluation and Decision Making (Itasca, Ill.: Peacock, 1971), prepared for the education society Phi Delta Kappa by Daniel L. Stufflebeam and others, evaluation is defined as "the process of delineating, obtaining, and providing useful information for judging decision alternatives."

credibility with respect to the knowledge base we have accumulated in the field of educational outcomes.[9]

B. The Education Enterprise and Educational Evaluation

It will be helpful to view educational outcomes and outcomes evaluation in the broader framework of the overall education enterprise.

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[9]A 1976 report by the Committee on Vocational Education Research and Development (COVERD) noted that "$250 million spent by the U. S. Office of Education in vocational education research and development during the last 10 years has not had documented, widespread impact" (Assessing Vocational Education Research and Development, National Academy of Sciences, p. 1). Commenting on COVERD's findings, the president of the American Vocational Education Research Association observed that "the substance and process of vocational education research leaves something to be desired" (J. Robert Warmbrod, "Evaluation Research in Vocational Education," paper presented at the AVERA annual meeting in Houston, Texas, December 6, 1976, and reprinted in Beacon, Vol. 6, No. 1 (January 1977) pp. 1, 6-11.) Other evaluators have noted that "most of . . . [the evaluation of investments in the human agent, such as vocational and technical education] is of little or no use for purposes of making reasoned choices among competing social programs . . . due to the methodological errors which mar many studies as well as the lack of effective techniques to handle many of the more difficult issues which arise as a part of the evaluative process (Jerome Moss, Jr., and Ernst W. Stromsdorfer, "Evaluation Vocational and Technical Education Programs" in Gerald G. Somers and J. Kenneth Little, Vocational Education: Today and Tomorrow, Center for Studies in Vocational and Technical Education, University of Wisconsin, 1971, p. 221). Floyd L. McKinney found "a lack of consistency in the use of acceptable procedures in conducting follow-up studies" (Program Evaluation in Vocational Education: A Review, ERIC Clearinghouse on Career Education, The Center for Vocational Education, Ohio State University, 1977, p. 24). Writing in an official U. S. Department of Labor magazine in 1974, a Columbia University researcher observed that "the large body of studies [analyzing] the outcomes of high school vocational education [are] beset with conceptual problems, methodological pitfalls, and statistical limitations . . . . Proceeding from different values and assumptions, the analysts have not even agreed on the objectives or outcomes to be tested" (Beatrice G. Ruebens, "Vocational Education: Performance and Potential," Manpower, July 1974, pp. 23-29). For additional information on the state of vocational education evaluation see Darcy, Robert L.; Bolland, Kathleen A.; and Farley, Joanne. Vocational Education Outcomes (Columbus: National Center for Research in Vocational Education, The Ohio State University, 1979) pp. viii and passim as well as Bolland, Evaluative Bibliography, passim).

Figure 1 lists six components of the educational system, each of which may be seen as an appropriate object for description and evaluation. These interdependent sets of education variables are:

(1) Context -- the milieu of circumstances and needs, organizational arrangements, societal values, institutional settings, and the physical environment within which education takes place;

(2) Students -- characteristics of the potential learners, who are recipients of investment activities and whose human capital[10] will be enhanced when the investment activities are successfully carried out;

(3) Resources -- in money terms, the funds allocated to pay for real resources employed in educational production; in real terms, the quality and quantity of human and physical factors of production so employed (e.g., teachers, physical plant, instructional supplies and equipment);

(4) Goals -- the stated or unstated aims of educational programs (i.e., intended educational outcomes); and

(5) Processes -- instructional methods, program procedures, and educational technologies (broadly defined);

(6) Outcomes -- short-term consequences and longer-term impact resulting from vocational programs (i.e., dependent variables associated with the interaction of the five preceding sets of independent variables).

This six-factor analytical framework is similar to the CIPP model (Context, Input, Process, Product) described in evaluation literature, although the terms are not defined in

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[10] Acquired capabilities that can be used in one's capacity as a factor of production, i.e., as a human resource. See Robert L. Darcy, "The Nature of Economic Enterprise," in Edwin L. Herr (ed.) Vocational Guidance and Human Development (Boston: Houghton Mifflin 1974), p. 121. Note that human capital does not denote people, but capabilities embodied in people. For a simplified explanation of human capital investment, see William E. Becker, Jr., "Investment in Human Capital," pp. 59-76 in Warren G. Meyer (ed.) Vocational Education and the Nation's Economy (Washington, D. C.: American Vocational Association, 1977).

COMPONENTS OF THE EDUCATIONAL ENTERPRISE
AND
TYPES OF EDUCATIONAL EVALUATION

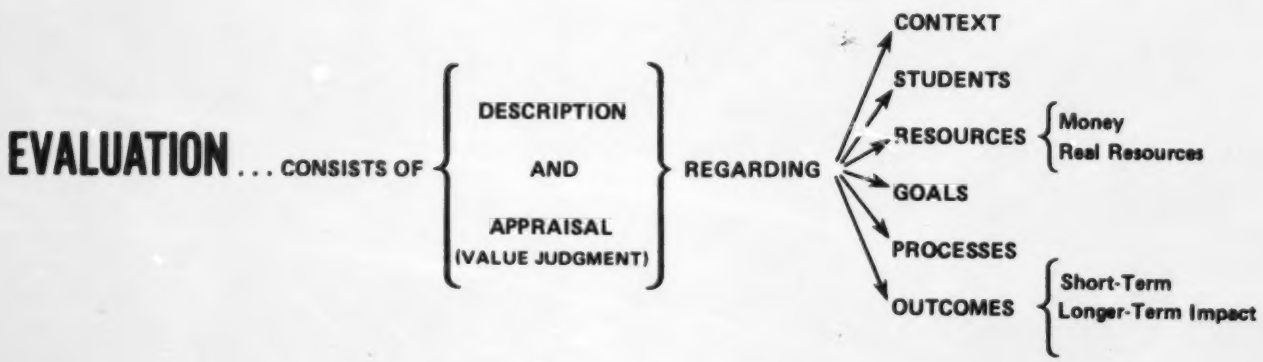

Figure 1

precisely the same way.[11] It also resembles a conventional education production function, which relates input factors to educational products or outputs.[12] The five "input" factors listed in Figure 1, which interact to constitute educational programs or "treatments," are recast in Figure 2 (note input factors n_1 . . . n_5) in the format of a production function. This analogy suggests that over a period of time, and subject to the influence of intervening forces and error factors, it is theoretically possible to observe certain outcomes as having been generated by (i.e., significantly associated with) given educational treatments.

As suggested above, each component of the educational enterprise represents a potential object of systematic inquiry and evaluation. For purposes of description and appraisal, one may single out student characteristics (e.g., age, sex, mental ability, socioeconomic background of vocational students); or the quality of resources employed (e.g., training and experience of teachers); or educational outcomes (e.g., skill proficiency, employment status, hourly earnings) for special scrutiny rather than addressing, under the rubric of "program evaluation," the totality of factors relevant to educational performance. Indeed, this selective, "partial equilibrium" methodology, based on the principles of specialization and division of labor, might produce the same results for vocational education evaluation that are claimed in economics: sharply increased productivity. We need to know far more than we presently know about student characteristics, context, resources, goals, and the processes of vocational education, as well as about outcomes. And certainly we need to know about correlations and interactions among the variables. The appeal for special attention to particular facets of the vocational education enterprise is not meant to imply that each component stands in isolation from the others. In education, as in the economic world, everything depends on everything else. Yet, it can still be fruitful to study parts and facets.

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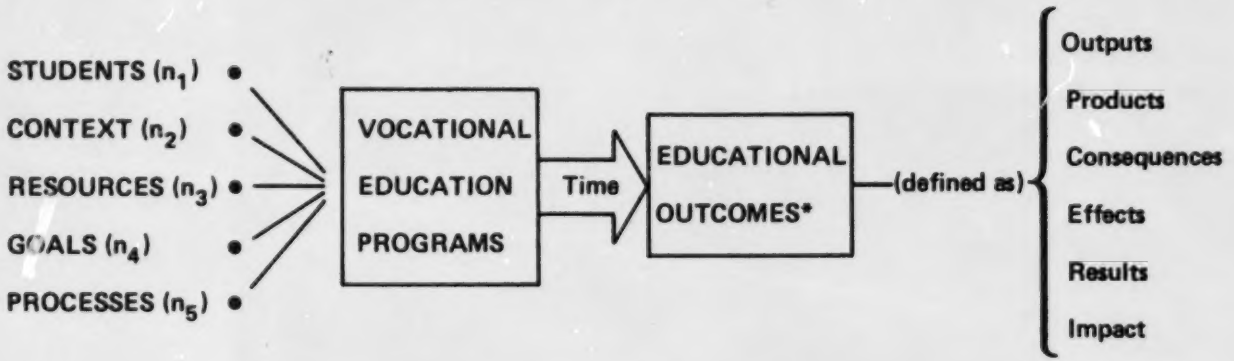
[11] See Daniel L. Stufflebeam, pp. 128-150 in Worthen and Sanders, Educational Evaluation: Theory and Practice.

[12] See Richard V. Kauffman, A Study of the Educational Production Function, Ph.D. thesis, Department of Economics, Colorado State University, 1974, pp. 24-31 (reprinted in hard copy by University Microfilms, Ann Arbor, 1978); and Daniel C. Rogers and Hirsch S. Ruchlin, Economics and Education: Principles and Applications (New York: Free Press, 1971), pp. 107f, 119ff.

THE EDUCATIONAL PRODUCTION FUNCTION AS A FRAMEWORK FOR EVALUATION

$0=f(S, C, R, G, P)$*

Outcomes are a function of Students, Context, Resources, Goals, Processes



*Observed outcomes are subject to the influence of extraneous forces and error factors.

Figure 2

C. Vocational Education Outcomes

The focus of this essay, however, is on vocational education outcomes, which are broadly defined as the consequences of vocational programs.[13] Figure 3 illustrates the range and diversity of possible outcomes associated with vocational education programs. All outputs, products, consequences, effects, results, and impact of vocational programs are recognized as outcomes whether they are intended or unintended, positive or negative, short-term or long-term, economic or noneconomic, direct or indirect. These outcomes may affect individual students, society as a whole, particular societal entities (such as the local school system), or functional characteristics such as the human resource base of the state and local economy. The outcomes may be seen as resulting from a student's participation in vocational education or from the existence of ongoing programs in the community. Outcomes are manifest as changes in individual or societal capabilities (including knowledge and skills), attitudes, attributes, status, or circumstances.[14]

Some outcomes, such as the acquisition of occupational skills by secondary school students who complete vocational programs, are objectively observable and often quantifiable. Others, such as the development of work-related attitudes or leadership capability, may be perceived more subjectively while defying straight-forward empirical observation. Ease of measurement does not qualify a particular outcome as necessarily important or valid as a criterion for evaluating vocational education, though it certainly may offer practical advantages for such purposes.

Figure 3 does not purport to identify all the kinds and characteristics of educational outcomes. No explicit reference, for example, is made to physical, esthetic, or moral development. The representation is suggestive and impressionistic, hence the question marks. Every effect that is

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[13] Definitions of vocational education and vocational programs are presented in Section III below.

[14] A distinction is sometimes made between educational outputs and outcomes, the latter implying change while the former merely suggests "through-put." No attempt is made in this paper to distinguish among such terms as educational product, output, outcome, impact, etc. As indicated in Figure 3, outcomes are broadly defined to include all of the consequences and results of the education enterprise.

AN ILLUSTRATION OF SOME OF THE DIVERSE TYPES

AND CHARACTERISTICS OF VOCATIONAL EDUCATION OUTCOMES

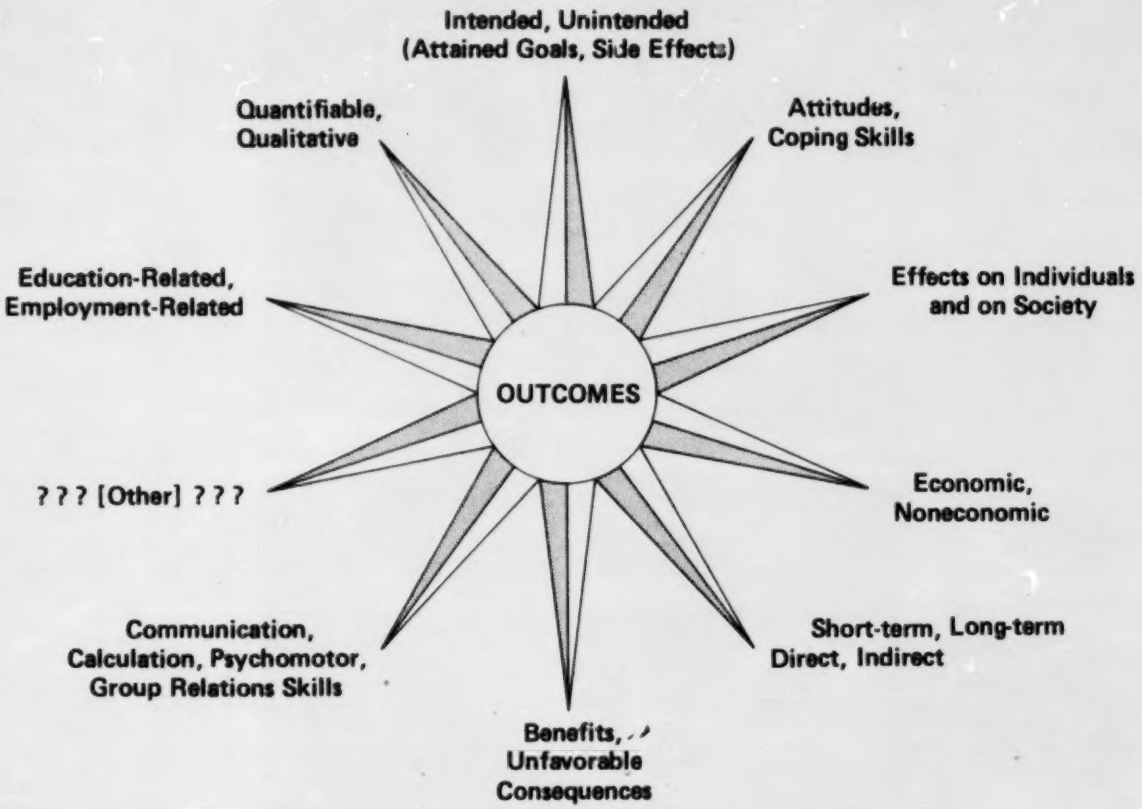

Figure 3

significantly linked with a vocational program is regarded as a vocational education outcome. Not all of these consequences, however, are readily observable. Professional debate, social criticism, and educational research have made the American people keenly aware of how much we do not know about the effects of schooling. We therefore need to speak of possible outcomes of vocational programs without confining the analysis to such narrow outcome sets as preannounced goals, presumed benefits, or quantitatively measured impact.

Outcomes typically are multidimensional--e.g., a mixture of educational and economic consequences, cognitive and affective, individual and societal--and they occur as "joint products" in the sense of multiple outputs occurring together in a single production process. Thus, just as lumber and wood particles are simultaneous outputs of the logging industry, so too are occupational skills, job-related attitudes, and a high school diploma--all "products" resulting from the same schooling experience. Which is the "product" and which the "byproduct" is a matter of selective perception. A comprehensive assessment of vocational education outcomes would acknowledge all of the observable consequences and presumably focus on the ones which are of special relevance to the evaluation task at hand. It would also recognize the opportunity costs or tradeoffs associated with vocational programs, i.e., the alternative educational outcomes foregone because the resources are being utilized in vocational programs.

Differential outcomes may be associated with variations in educational treatment (see Section III below), intensity of treatment, i.e., "time on topic"), educational level (high school, post-secondary, adult), student characteristics (age, sex, race/ethnicity, socioeconomic background, physical or mental handicap, aptitudes, career interests, etc.) and a host of other variables indicated in Figures 1 and 2 above. This follows from the recognition that variation in the "input" factors of the educational production function (Figure 2 above) predictably will result in differential outcomes.

Awareness of the broad range, diversity, and multidimensional nature of possible educational outcomes is important to practitioners, researchers, evaluators, policy makers, and the general public. It helps offset the narrow perception of equating outcomes simply with goals or benefits, while ignoring "side effects." This expanded view in turn triggers a search for evaluative standards beyond preannounced

program objectives and can stimulate a re-examination of program implementation strategies and overall policy.[15]

As an example, when state and local units of government first enacted general sales taxes, their single purpose was to raise revenue. Attention was focused on the outcome of fiscal productivity. Another outcome of the tax, however, was its regressive burden: low-income consumers paid higher effective tax rates (tax payments as a percentage of income) than high-income consumers. While the purpose of the tax was not to redistribute income, that was nevertheless an outcome. Awareness of this consequence eventually led many states to amend the general sales tax by exempting food, thereby reducing the regressivity of the tax.

Similarly, if an important outcome of vocational education is to increase the rate of school completion even though the stated objective (or specified evaluation criterion) is job placement, then knowledge of the school-completion outcome can be useful to policy makers as they revise legislation and allocate resources for the support of various programs. "Side effects" are consequences no less than attained objectives. As the environmental and consumer protection fields illustrate, yesterday's side effect may be tomorrow's most significant outcome.

Table I lists 30 questions concerning possible outcomes of vocational education. The outcome questions (verbal expressions of empirical phenomena) listed here are not intended

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[15]In a recent monograph on noneconomic outcomes, the U.S. Department of Labor noted the "unfortunate tendency to evaluate many employment and training programs in terms of narrow economic, cost-benefit analyses alone." The Job Corps was cited as "a good example of a program that should not be viewed so narrowly--a program in which the noneconomic impacts are at least as important and possibly more so, than economic benefits such as higher earnings." The report identifies 21 different noneconomic outcomes in three areas: (1) job related; (2) social-attitudinal; and (3) health-related. The outcomes are discussed in the context of "social development objectives . . . rehabilitation goals, and . . . remediation." U.S. Department of Labor, The Noneconomic Impacts of the Job Corps, R & D Monograph 64, Employment and Training Administration (Washington, D.C.: U.S. Government Printing Office, 1978) pp. iii-iv. More than 200 economic and noneconomic outcomes are identified in Joanne Farley, Vocational Education Outcomes: A Thesaurus of Outcome Questions (Columbus: National Center for Research in Vocational Education, The Ohio State University, 1979).

Table I

VOCATIONAL EDUCATION OUTCOME QUESTIONS: ILLUSTRATION OF THE RANGE AND DIVERSITY OF POSSIBLE OUTCOMES

No.	Outcome Questions	Thematic Area
1.	Do students become occupationally proficient and ready for entry-level employment as a result of completing a vocational program?	Skill acquisition
2.	What proportion of former vocational students are employed in training-related jobs six months following program completion?	Employment in training-related jobs
3.	Are dropout rates lower for vocational students than for comparable students enrolled in general/academic curricula at the secondary school level?	Schooling
4.	Do vocational programs at all levels--high school, postsecondary, and adult--significantly strengthen the human resource base of the local and state economy?	Economic development
5.	One year following program completion, are former vocational students earning higher hourly wages than comparable, general/academic students in similar jobs?	Wage rates
6.	Are the parents of students who are enrolled in vocational programs better satisfied with the overall high school program than parents of students enrolled in general/academic curricula?	Parental satisfaction with school program
7.	Do vocational students obtain jobs which they consider acceptable, whether in training-related fields or not, within a specified time period following program completion?	Employment
8.	Are vocational programs more effective or less effective than general/academic curricula in enhancing the self-image and self-confidence of students who are preparing for employment?	Student self-image

continued ⟶

Table I (Continued)

VOCATIONAL EDUCATION OUTCOME QUESTIONS: ILLUSTRATION OF THE RANGE AND DIVERSITY OF POSSIBLE OUTCOMES

No.	Outcome Questions	Thematic Area
9.	Do vocational students receive higher employer ratings than comparable general/academic students following a specified period of employment?	Employer assessment of students
10.	Do vocational students develop leadership ability through their participation in occupationally-related youth programs such as Distributive Education Clubs of America (DECA), Future Homemakers of America (FHA), Future Farmers of America (FFA), and Vocational Industrial Clubs of America (VICA)?	Leadership development
11.	Are students who are currently enrolled in vocational programs better satisfied with their overall school experience than comparable students enrolled in general/academic curricula?	Student satisfaction with schooling
12.	Do graduates of vocational programs express more, less, or the same job satisfaction as comparable graduates of general/academic programs holding similar jobs?	Job satisfaction
13.	Does participation in high school vocational programs reduce the incidence of school vandalism and other antisocial behavior on the part of students?	Antisocial behavior
14.	Does vocational education (high school, postsecondary, adult) provide its graduates with a general set of skills and basic work disciplines that significantly increase their chances for successful employment?	Employability development

continued ⟶

Table I (Continued)

VOCATIONAL EDUCATION OUTCOME QUESTIONS: ILLUSTRATION OF THE RANGE AND DIVERSITY OF POSSIBLE OUTCOMES

No.	Outcome Questions	Thematic Area
15.	By completing a vocational program, do students acquire job-seeking skills such as how to write a resume, how to participate in an interview, and knowing where to look for job opportunities?	Job-search skills
16.	Do students enrolled in vocational programs learn the basic cognitive skills of speaking, reading, writing, and numerical calculation as effectively as comparable students in academic/general curricula?	Educational achievement
17.	Does participation in a vocational program give students a realistic understanding of what employers will expect of them on the job?	World-of-work understanding
18.	Is the occupational mobility of vocational students limited both horizontally and vertically by the content of the programs (e.g., training in narrow skill areas or in occupations with diminishing job opportunities)?	Occupational mobility
19.	Does participation in a high school vocational program inhibit or enhance a student's opportunities for a college education?	College education
20.	Do students who complete vocational programs have a more realistic understanding of our society and its economic system than comparable students who complete general/academic programs?	Socioeconomic understanding
21.	Are the returns from individual and social investments in vocational education lower, higher, or the same as returns from investments made in general/academic programs below the baccalaureate level?	Economic returns to schooling

continued

Table I (Continued)

VOCATIONAL EDUCATION OUTCOME QUESTIONS: ILLUSTRATION OF THE RANGE AND DIVERSITY OF POSSIBLE OUTCOMES

No.	Outcome Questions	Thematic Area
22.	Does participation in vocational programs on the high school level contribute measurably to the moral development of students?	Moral development
23.	Through their participation in vocational education programs (e.g., cooperative education, placement in part-time jobs), do disadvantaged minority youth earn more income while still in school than comparable students in general/academic programs?	Student earnings
24.	Do high school, postsecondary, and adult vocational programs increase occupational awareness, training opportunities, and job access for women in both traditional and nontraditional areas?	Employment opportunities for women
25.	Does favorable community reaction to ongoing vocational programs result in general expressions of satisfaction and financial support for the entire local school system?	Community support for education
26.	Do students who have participated in vocational programs on the high school level have more clearly defined occupational goals than those expressed by nonvocational students who enroll for postsecondary education?	Career planning
27.	Do high school home economics courses significantly increase the consumer skills of students who have taken them?	Consumer skills

continued ⟶

Table I (Continued)

VOCATIONAL EDUCATION OUTCOME QUESTIONS: ILLUSTRATION OF THE RANGE AND DIVERSITY OF POSSIBLE OUTCOMES

No.	Outcome Questions	Thematic Area
28.	Do certain admissions and student assignment practices followed in vocational education tend to reduce or to reinforce occupational discrimination on the basis of race, class, or sex?	Occupational discrimination
29.	Is job-search time lower for students who participated in vocational programs, than for comparable workers who did not?	Unemployment
30.	How do the annual earnings of vocational graduates compare with those of general/academic graduates, both in the short term and in the long run?	Earnings

(continued from page 14).

to imply anything about what we actually know, believe, or suspect concerning the consequences of vocational programs. The questions simply illustrate the broad and diverse range of possible outcomes.

It is interesting that while some of the outcome questions relate to employment and earnings, other focus

on such topics as schooling, antisocial behavior, economic development, parental attitudes, and the like. Some of the questions imply positive consequences for vocational programs, while others may suggest negative or neutral effects. What is quite clear is that even a limited array of vocational education outcomes, as we have illustrated here, extends well beyond traditionally announced program objectives, labor market benefits to individual students, and alleged harmful or beneficial effects on educational development.

Several of the outcome questions in Table I have been addressed in empirical research and evaluation studies.[16] Undocumented assertions have been made regarding the facts alluded to in other questions. And some of the questions have simply been posed without conjecture as to the answers. At this point in the discussion, in keeping with our intent to expand awareness of the range and diversity of outcomes, we simply wish to regard these questions as illustrative verbal expressions of possible results: waves and ripples that vocational programs may or may not be generating.[17]

D. Outcomes and Outcome Statements

Figure 4 outlines a conceptual framework for evaluating vocational education with respect to outcomes. The outcomes themselves (1) are empirical phenomena: real-world consequences of educational programs. Outcome statements (2) are verbal expressions of these cause-and-effect phenomena. Educational outcome statements can take the form of declarative sentences or hypotheses: "Completers of high school vocational programs have lower rates of unemployment six months after graduation than comparable completers of academic/general curricula." Or they can be phrased as questions (as in Table I): "Do completers of high school vocational programs have lower rates of unemployment six months after graduation than comparable completers of academic/general curricula?" An outcome statement describes what happens to

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[16]For descriptive and evaluative comments on these studies see Bolland, Evaluative Bibliography.

[17]See Farley, Thesaurus for a categorized listing of 228 vocational education outcome questions along with an analysis of the structure and content of outcome statements.

EDUCATION OUTCOMES EVALUATION FRAMEWORK

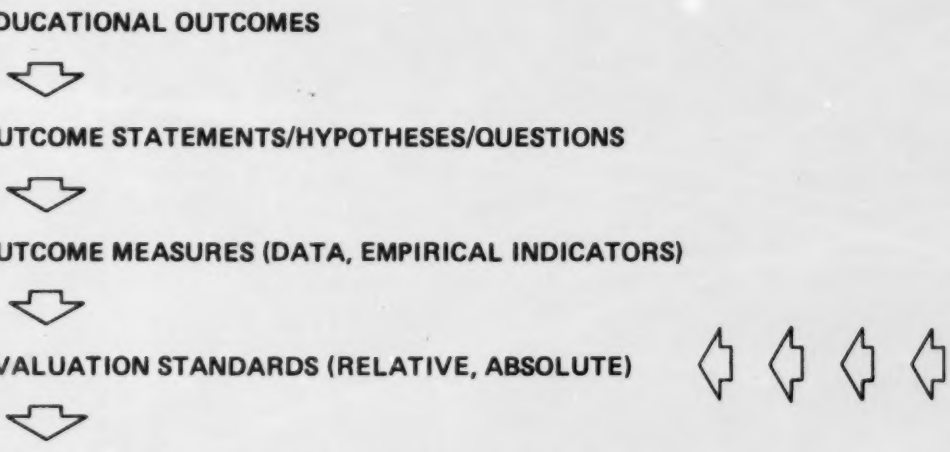
(1) EDUCATIONAL OUTCOMES
(2) OUTCOME STATEMENTS/HYPOTHESES/QUESTIONS
(3) OUTCOME MEASURES (DATA, EMPIRICAL INDICATORS)
(4) EVALUATION STANDARDS (RELATIVE, ABSOLUTE)
(5) ANALYSIS, INTERPRETATION, AND EVALUATION
(6) FINDINGS CONCERNING THE CONSEQUENCES OF PARTICULAR PROGRAMS
(7) APPLICATIONS OF FINDINGS
(7-A) • POLICY (GOALS, RESOURCES, RESOURCE ALLOCATION)
(7-B) • PROGRAM DESIGN
(7-C) • PROGRAM MANAGEMENT
(7-D) • ACCOUNTABILITY

Figure 4

whom and how, and in some cases also indicates when, where, and why. As a minimum, a meaningful outcome statement clearly identifies (a) an outcome, (b) the person or thing affected, and (c) the educational treatment. Often the statement (or outcome question) will also identify (d) the agency through which the treatment is applied, (e) a rationale for the posited outcome, and (f) a time framework. Expressing an educational outcome in precise verbal form affords two important benefits: clarity of understanding and clarity of communication. As Roget of Thesaurus fame and others have pointed out, words are not only a medium of communication, but equally important, they are instruments of thought.[18]

In Table I, questions are used rather than statements or hypotheses. This is to avoid giving an impression that we are asserting beliefs or reporting documented facts.

Outcome measures (point 3 in Figure 4) are empirical indicators of the educational outcomes. These indicators may be quantitative (differences in amount, expressed numerically/statistically) or qualitative (differences in kind, described verbally). The outcome measures are observable indicators of the changed conditions or circumstances resulting from an educational program. These changes may be observed directly or indirectly. Outcome measures require empirical information such as employment and wage data, and standards or norms for evaluating the data. It is at point 4 in the framework, therefore, that positive analysis of educational outcomes (observation and descripiton) merges with normative analysis (appraisal of data) to produce the judgment of worth that constitutes educational evaluation (5).

The findings about program consequences (6) that result from evaluation research become available for a variety of applications (7) including policy making, program improvement, accountability, and decisions to terminate, expand, or otherwise modify the education enterprise. Returning to

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[18]The author is indebted to Herbert A. Simon, winner of the 1978 Nobel Prize in Economics, for Roget's observation: "The use of language is not confined to its being the medium through which we communicate our ideas to one another; it fulfills a no less important function as an instrument of thought; not being merely its vehicle, but giving it wings for flight." Herbert A. Simon and Allen Newell, "Models: Their Uses and Limitations" in Leonard D. White (editor) The State of the Social Sciences (Chicago: University of Chicago Press, 1955), p. 66.

4, we want to emphasize the point that introducing value criteria (standards of goodness or badness) into the research process is prerequisite for making evaluative judgments. Whether a particular outcome such as the placement of 65% of all vocational graduates in training-related jobs is considered good, bad, or indifferent depends on the evaluative standards applied. Knowledge of facts alone may be sufficient for research, but in the absence of a standard for comparison, there can be no meaningful evaluation.[19]

Standards or norms for evaluating observed outcomes can thus be regarded as the link between positive outcomes analysis and evaluation of vocational education in terms of outcomes, which by definition is a normative undertaking. Where these standards come from and how they are used are therefore fundamental issues to be considered in this paper.[20]

III. SOME KEY ISSUES IN VOCATIONAL EDUCATION OUTCOMES EVALUATION

As noted by the authors of a Rand Corporation report on the findings of educational research, "Education is an extremely complex and subtle phenomenon." Moreover, educational research is subject to serious limitations of data, measurement instruments, and experimental controls, including the influence of factors outside the schools ("perhaps strong enough to 'swamp' the effects of variations in educational practices"). The upshot is that "research has found

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[19] Jerome Moss, Jr., The Evaluation of Occupational Education Programs, Technical Report, Research Coordination Unit in Occupational Education, University of Minnesota, September 1968, p. 5.

[20] As suggested in Section I, outcomes analysis addresses two types of questions: What are the actual consequences of vocational education? and What are the desirable consequences of vocational education? The first is an empirical matter-of-fact question triggering a search for information about what is. The second is a normative question leading to a search for values indicating what ought to be. To the extent that value judgments are influenced by evidence and reason, the search for values and facts will be intertwined.

nothing that consistently and unambiguously makes a difference in student outcomes."[21]

While the Rand assessment dealt with general education (and in the context of the federal government's role in school finance), the conclusions are not unlike those reported above for vocational education. Indeed, vocational education research and evaluation faces all of the general problems confronting education plus some special difficulties of its own, to which attention is now turned.

A. What is Vocational Education?

The study of educational outcomes, as illustrated in Figures 1 and 2 above, investigates the consequences of distinctive educational treatments or interventions. What is the nature of the treatment carrying the label "vocational education"?

According to the Education Amendments of 1976 (Sec. 195), the term vocational education means "organized educational programs which are directly related to the preparation of individuals for paid or unpaid employment, or for additional preparation for a career requiring other than a baccalaureate or advanced degree." In further defining an organized education program, the law refers to "instruction related to the occupation or occupations for which students are in training or instruction necessary for students to benefit from such training."

In a generic sense, vocational education can be defined as any program of education or training that enhances one's capability to pursue a vocation, i.e., a calling or occupation or career. Defined more narrowly for programmatic

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[21] Harvey A. Averch and others, How Effective Is Schooling? A Critical Review and Synthesis of Research Findings, Rand Corporation, Santa Monica, Calif., March 1972. See pp. ixf, 154, 160. The authors emphasize that they are "not suggesting that nothing makes a difference, or that nothing 'works'; the problem is that research findings often conflict." In a conversation with the author of this paper, Michael Scriven pointed out, however, that cognitive outcomes do consistently show up. It is when educators "slide into grandiosity" searching for impact on life style, income distribution, and similar variables that planned variations in education seem not to work.

purposes, vocational education refers to occupational programs which are included in state plans developed by the respective State Boards for Vocational Education. A similar administrative definition limits vocational education to programs supported by Federal funds.[22] In practice, "the vocational education program has become so broad and diverse in its response to manpower demands and the needs of all ages and ethnic groups that it is almost impossible to describe in any definitive way."[23]

One may question whether it makes sense to speak of "the" vocational education program, not only because of the manpower demands and needs alluded to, but for at least two additional reasons. It has frequently been observed that there is no national vocational education program in the United States. We have 50 different state programs each with its own supposed needs, resources, goals, priorities, standards, definitions, data requirements, and delivery systems. In light of these differences, are there enough commonalities among state programs to discern a vocational education program that is reasonably "typical" for the nation? The answer would seem to be "Yes." Despite some

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[22]Vocational education is defined in Encyclopedia Brittanica as ". . . instruction that is intended to fit persons for industrial or commercial occupations" (Vol. 23, p. 95). The Dictionary of Education (edited by Carter V. Good) defines vocational education as "a program of education below college grade organized to prepare the learner for entrance into a particular chosen vocation or to upgrade employed workers; . . . training or retraining . . . is given in schools or classes under public supervision and control or under contract with a state board or local education agency" (p. 645). In Ohio State University's Proposal for a National Center for Research in Vocational Education, a distinction is noted between "Vocational Education (capitalized), the program supported under federal legislation; and vocational education in a generic sense . . . [which] embraces all activities, public and private, which are designed to contribute directly to occupational proficiency" (Vol. I, pp. 1f). Examples of such activities cited in the proposal include military training, Comprehensive Employment and Training Act (CETA) programs, public and private school vocational programs, and apprenticeships.

[23]Mary L. Ellis, A Report to the Nation on Vocational Education (College Park, Maryland: Ellis Associates, 1975), p. 2.

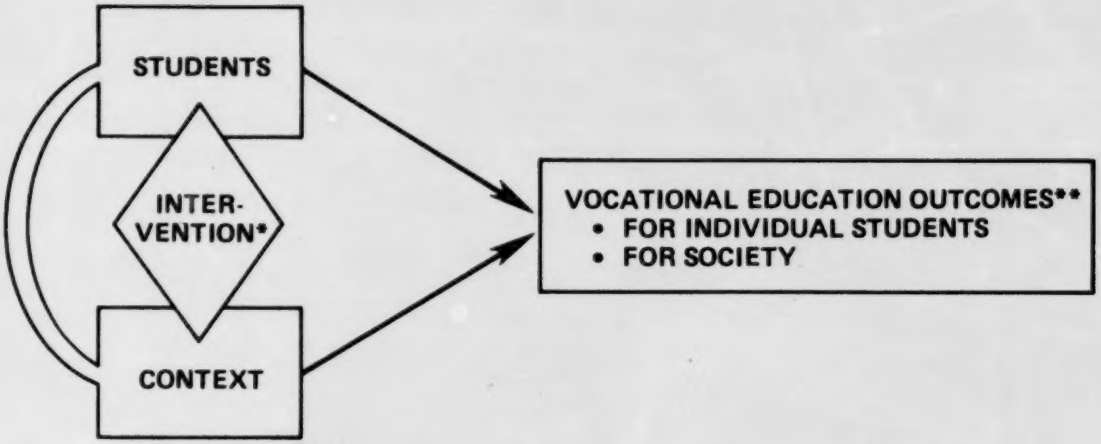
interstate differences in Student Characteristics (n_1 in Figure 2 above) and Context (n_2) it seems reasonable to this writer that nationally shared Goals (n_4) and the existence of national markets for Resources (n_3) and Processes (n_5) would combine to establish vocational education programs in the fifty states that are in essence quite similar. If this is in fact true, some important outcomes should be observable as a national pattern.

The other respect in which diversity might undermine the plausibility of treating vocational education as an entity relates to differences among particular occupational programs. Does Distributive Education, for example, have less in common with Vocational Agriculture than it does with the academic/general school curriculum? Are inter-program differences in goals, methods, personnel, and philosophy so vast that the occupational curricula share little other than the "vocational" label? Is it true, as some have claimed, that "There are no vocational educators, only Vo Ag, Home Ec, and T & I educators"? Operating on the premise that the more specialized and unique a program is, the easier it is to demonstrate differential outcomes, a case can be made for evaluating highly specific occupational curricula (such as Air Conditioning, Automotive Services, Diesel Mechanics) rather than clusters (such as Trade and Industrial Occupations). However promising this "component-program" approach to evaluation might appear, it would nevertheless pose methodological problems of its own when trying to aggregate results for the purpose of producing generalizations about "the outcomes of vocational education."

B. Vocational Programs as Educational Treatments

Answering the question, What is vocational education? is more than an "academic" exercise. If evaluation entails both description and appraisal as suggested in Section II above, a necessary first step for evaluation is to identify the entity to be described. What are the essential features of the distinctive educational treatment or intervention being evaluated? Figure 5 depicts the relationship between "input" variables and educational outcomes in a manner that differs somewhat from the production function of Figure 2. Intervention (or program treatment) is defined in Figure 5 to include Resources (n_3), Goals (n_4), and Processes (n_5); while Students (n_1) and Context (n_2) are depicted separately. This formulation has the dual advantage of isolating the two "input" variables that are less amenable to variation while also highlighting the fact that outcomes may be observed with respect to either (a) individual students or (b) social context. The linkage on the left side of the schematic indicates continuous mutual interaction between Students and

DETERMINANTS OF VOCATIONAL EDUCATION OUTCOMES



*Intervention or educational treatment is narrowly defined here to encompass Resources (n_3), Goals (n_4), and Processes (n_5). (See Figure 2 above.)

**Observable effects of distinctive educational treatments (subject to the influence of extraneous forces and error factors).

Figure 5

Context. Using this framework, we can build on the discussion of program definition in the preceding section.

The focus there was on interstate differences in vocational education programs and possibilities of disaggregation based on occupational clusters or specific program curricula. We now want to approach the unit-of-analysis issue from the broad perspective of the total educational program. The question may be posed: Is it appropriate for evaluation purposes to consider vocational education, however that entity may be defined, as a treatment distinct from the total educational program (especially the occupational skills component)?

In discussing the issue of criterion variables for vocational education, one observer points to the "separation of vocational and general education" as a major source of difficulty. "As long as vocational education claims to be the sole input for the knowledge, skills, and attitudes required for occupational competence," he argues, "it will be vocational education, not the total school program, that takes the brunt of criticism that schools are not accomplishing satisfactorily their functions of occupational . . . preparation."[24] In other words, if outcome criteria such as occupational proficiency, employability, actual employment, work adjustment, "satisfactoriness" to employers, and a successful transition from school to work are to be used for evaluating program performance, should the treatment that is being evaluated be (a) the total school program, or (b) the subset of courses and experiences labeled vocational education?

Whether vocational education does indeed claim to be the sole source of the components of occupational competency--or has such a function ascribed to it--is a moot point. The practical question for vocational education evaluation is whether (a) or (b) is regarded as the treatment. If the former, then "evaluation of the school's occupational education function [for all of the school's students] becomes a complicated and methodologically sophisticated affair . . .

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[24]Warmbrod, "Evaluation Research in Vocational Education," pp. 8f.

something of the magnitude of the Coleman Report."[25] It might be conjectured that this strategy would also tend to remove the focused heat of educational accountability from vocational education.

Yet a legitimate question remains. So long as schools offer a course or set of courses and experiences under the rubric of vocational education--and with earmarked funding--there will be a reasonable expectation for an educational quid pro quo. What comes out of the vocational education process in response to the specialized resources that go into it? Perhaps the outcomes that can reasonably be expected will be much more limited than occupational competence, employability, employment, successful work adjustment, and the like. Some differential outcomes, however, should presumably be identifiable as resulting from distinctive goals, processes, and resources.

C. Evaluative Criteria and Standards, Experimental Controls, and Comparison Groups

According to one of the definitions listed in Section I, evaluation is the process of comparing performance data with clearly specified objectives. This conception of evaluation is associated with the currently popular view that the sole or dominant purpose of evaluation is program improvement: "Evaluation is not to prove, but to improve."[26] The approach helps explain why many people equate a study of vocational education outcomes with an investigation of goals and the extent to which they have or have not been achieved. Clearly,

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[25]Warmbrod argues (on p. 9 of his Beacon article): "When vocational education is viewed as a function of the total school program, some important issues relevant to the design and conduct of evaluation studies come into focus." First, the target population becomes all of the school's students, not just vocational students. Second, the treatments to be evaluated are various mixes of vocational and other courses. And third, "an evaluation of the school's occupational education goal becomes a part of the evaluation of all the goals and functions of the schools."

[26]Floyd L. McKinney, Program Evaluation in Vocational Education: A Review (Columbus: The ERIC Clearinghouse on Career Education, Center for Vocational Education, Ohio State University, 1977) p. 2.

however, the observable effects of vocational programs may differ from the preannounced intent of such programs not only in terms of discrepancies between stated outcome goals and actual achievement, but also with regard to such side effects as (a) benefits not previously identified as goals and (b) other consequences that might be considered neutral or negative. In short, evaluation generically defined can serve other functions besides program improvement; and evaluative criteria can be derived from sources other than preannounced objectives.

It was noted in the Introduction that one function of research is to describe the consequences of given actions, such as the observable outcomes of particular educational programs. Positive outcomes analysis, as defined above, addresses the full range of educational outcomes, not just traditional objectives and presumed benefits. This breadth of scope can produce insights which in turn may generate new goals and priorities. In this way, knowledge of what is can contribute to informed judgments of what ought to be. If a stated objective of vocational education is preparation for employment in a training-related occupation but an observed and perhaps unanticipated outcome is employability in a much broader range of occupations, with corresponding labor market benefits for individual students, then the latter goal might appropriately be added to or substituted for the narrower one.

As we earlier emphasized, in moving from positive analysis to evaluation, there is a need for evaluative standards. Some of the standards may be goal-based; but lacking a comprehensive, omniscient statement of program objectives, where does the full set of evaluation standards come from?[27] One source is professional judgment as to what

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[27] It has been noted that an area "not well addressed in writings on the evaluation process is the establishment of standards and the relative utility of various types of standards" (Quentin D. Clarkson and others, "A System for Establishing Evaluation Standards," CEDaR Quarterly, Vol. 10, No. 1, Spring 1977, pp. 17-19). In their proposed classification system, the authors distinguish four types of relative standards (Normative, Predicted, Control, Trend) and two types of absolute criteria (Arbitrary or intuitive, and Value-based). Moss and Stromsdorfer ("Evaluating Vocational and Technical Education Programs," p. 224) have observed that "the problem of evaluating vocational education is confounded by the fact that its objectives and outputs are multidimensional . . . [and] successful development, weighting, and estimation of performance indexes . . . has never been achieved."

constitutes reasonable and appropriate performance. Agreement might be reached (by a panel of evaluators or their sponsors?) that an unemployment rate under 10% constitutes an acceptable programmatic outcome. Or a flexible norm could be established for vocational graduates pegged at say 75% of or 110% of the current unemployment rate for all labor force participants in the same age group.

Evaluative standards can be derived from observing the outcomes of similar program activities, e.g., job-search time required for CETA graduates to find unsubsidized jobs compared with job-search time for vocational school graduates, or differences in outcomes resulting from the same program observed over a period of years.

And, in certain instances, verbal absolutes such as "satisfactory," "high," "low," "good," "bad," can be posited as nonempirical standards. These seem less likely to prove useful and credible than criteria based on empirical observations (whether quantitative or qualitative).

Perhaps the most promising source of evaluation standards is needs assessment, which recognizes that someone's desiderata or "justified goals"--though not necessarily the sponsor's or producer's--are appropriate criteria for evaluating educational programs.[28]

Once again, definitional problems intrude on the issue of evaluative criteria. Who are "vocational students," and who are the "nonvocational students" with whom status or performance might usefully be compared? A host of related issues arise, including the use of experimental controls and comparison groups. Definitions aside, is it appropriate to compare employment status and earnings of former vocational students with nonvocational (i.e., academic and general) students? Should comparisons of labor market status and performance (e.g., finding employment in occupations related to training) only be made among specific occupational curricula within vocational education, or can such comparisons be made legitimately between the totality of vocational students on one hand versus all other students? If the latter, which particular entry-level jobs are "training-related" for graduates of the high school academic and general curricula?

Consider the mandate under the Education Amendments of 1976 to evaluate vocational programs "according to the extent to which program completers and leavers (a) find employment

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[28] Scriven, "Evaluation Perspectives and Procedures," p. 51.

in occupations related to their training, and (b) are considered by their employers to be well-trained and prepared for employment." What are the procedural options for carrying out the evaluation? As an illustration, without extensive discussion, suppose the strategy is limited to identifying the former vocational students who have found training-related jobs (however defined) and then surveying their employers with given instruments. Assume that 60% of "program completers and leavers" found jobs in occupations related to their training and within this group, 80% were rated highly satisfactory with respect to their training and preparation for employment. How are the data to be evaluated? As noted in Section II, whether outcomes are considered good or bad depends on the comparison standards employed.[29]

It was suggested above that in the absence of clearly defined performance objectives or predetermined evaluation standards, it will be necessary to derive or develop such standards. One approach is to compare the status or performance of vocational students with another group, similar in all important respects--age, sex, mental ability, socio-economic background, etc.--except that the vocational students received a distinctive educational treatment that was not provided to the comparison group. In the case of secondary school students, the comparison might be made for vocational students versus nonvocational (i.e., academic plus general) who are similar in all characteristics except the treatment variable (participation in a vocational program). Given such a comparison, is it reasonable to hypothesize significant differences in the outcome variable for the respective groups?

The general rationale for the hypothesis is that substantially different educational treatments can be expected to yield significantly different outcomes. Whether the differences between "vocational education" and the "regular treatment" can be expected to result in employability differences is a more specific and problematic question. Of the two outcome variables mentioned in the Education Amendments of 1976, placement in a training-related job

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[29] It might be argued that interpretation of the facts and evaluations can be left to others--managers, policy makers, interested parties--who can furnish their own judgmental criteria. The question of who does the evaluating, however, does not diminish the importance of <u>how</u> it is done. Procedures and value premises will be of concern to all groups having a stake in the evaluation, and whoever supplies the values will presumably be held accountable. Dogmatic standards and vote-counting may seem expedient, but that leaves important value questions unanswered.

is a highly questionable evaluation criterion for at least three reasons: (a) "relatedness" is ambiguous; (b) vocational students who were enrolled in a particular curriculum may not desire employment in a related occupation (either because their preferred option was not offered and they simply took something that was available, or because the option they followed provided a useful opportunity to explore and reject a particular occupational field); (c) there are no appropriate comparison groups for whom differentiated fields of training can be identified.

On the other hand, the satisfactoriness-to-employers criterion could be applied in the following way. One could enumerate the former nonvocational students in a given school class who found jobs (irrespective of occupational fields), draw a sample matched to the vocational students according to characteristics such as mental ability and socioeconomic background, and then compare employer assessments of vocational and nonvocational students relative to the extent to which they are considered "well-trained and prepared for employment."

If the intent were to test the efficacy of the distinctive vocational education treatment with respect to employability (as measured by employer assessment of training and preparation), it would seem plausible to expect lower rates of unemployment for students exposed to an employment-related vocational education treatment as compared with students who were not.[30] If no significant differences occur

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[30]Such expectations are plausible for the same reason one would expect a student who completed three years of French to enjoy an advantage in the practice of that language over a comparable student who had spent three years taking history instead. A separate question relates to the amount of the differential in unemployment rates. Is achieving the differential worth whatever extra costs, if any, have been incurred in providing the vocational education program? Efficiency issues involving calculations of marginal benefits and marginal costs are not addressed in this paper, for two reasons. First, until we know more about gross outcome variables, it seems pointless if not pernicious to go through the exercise of manipulating the finely tuned pecuniary values needed to generate benefit-cost estimates. Second, there is so much methodological discretion inherent in performing benefit-cost, rate-of-return, and cost-effectiveness analyses that the findings may reflect the tastes and style of the investigator more faithfully than the nature of the empirical evidence.

between the matched groups, or if the regular group performed better than the treatment group, this certainly would not demonstrate that vocational education was an abysmal failure. It would suggest, however, that success criteria might be sought elsewhere; perhaps vocational programs do not enhance employability differentially but have other worthwhile outcomes. Alternative tests can presumably be designed to measure these outcomes, thereby helping to disclose the real nature of the vocational education outcomes function, i.e., the matrix of consequences associated with this distinctive educational treatment.

D. Nature and Quality of Outcome Data

Numerous studies have commented on the availability and interpretability of vocational education data. Evaluators have lamented the lack of national data, accurate data, comparable data, "hard" data, cost data, and impact data.[31] Our own review of empirical outcome studies and related inquiries concerning the credibility and persuasiveness of outcome data suggest the need for a profile of data types classified on the basis of the nature of the data and how they are generated. Table II distinguishes five types of data used in describing and appraising the consequences of vocational education.

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[31]Among the data-related problems identified by McKinney, Gray, and Abram (Interpreting Outcome Measures, p. 1), are those of "definitions, communication, and problems of handling data." In the same report (Ch. III), Donald W. Drewes comments on data format and other issues associated with setting up the proposed Vocational Education Data System (VEDS). For additional perspective on data problems, see Arthur M. Lee "Project Baseline: Historiographic Foundations for Vocational Education Statistics, "Educational Researcher, Vol. 6, No. 7 (July-August 1977), pp. 3-9. As indicated in footnote 2 above, two state-of the-art papers dealing with vocational education data are scheduled for publication by The National Center in 1979. See Bolland, Evaluative Bibliography for comments on data used in some recent studies of vocational education outcomes.

Table II

TYPES OF DATA USED IN VOCATIONAL EDUCATION OUTCOMES EVALUATION

Type of Data	Nature of Observation	Method of Observation	Examples
Status (Nonmonetary)	Objective	Observation and reporting of circumstance by a second party or directly by respondent.	Labor force status of former vocational students. School enrollment status of students currently or formerly enrolled in vocational programs.
Status (Monetary)	Objective	Observation by a second party of circumstances reportable in money terms.	Hourly wages of former vocational and nonvocational students. Annual earnings of former students. Cost and benefits of vocational programs.
Personal Judgment	Subjective	Expressed directly by respondent.	Student opinions or perceptions concerning quality and relevance of vocational programs. Employer assessment of the extent to which students are well trained and prepared for employment.
Ascriptive	Objective	Characterization by a second party based on records, test results, and/or observation and professional assessment.	Work-related attitudes and attributes of students. Vocational interests and aspirations of students.
Performance	Objective	Written or other tests of cognitive and psychomotor knowledge and skills.	Score on skill proficiency test (e.g., welding). Score on reading/math achievement test.

The literature review to which we allude disclosed heavier use of Status (Nonmonetary) and Personal Judgment data than the other types. In part, this reflects concern with the outcomes specified as evaluation criteria in the Education Amendments of 1976, namely "the extent to which vocational program completers and leavers . . . find employment in occupations related to their training, and . . . are considered by their employers to be well-trained and prepared for employment" (Sec. 112). Certain kinds of data are clearly more appropriate than other types as empirical indicators of particular outcomes (see Figure 4 above). In fact, outcome hypotheses can be formulated so explicitly that given types of data and particular evaluation standards are specified for use in performing the evaluation task.

Additional factors influencing the kinds of outcome data used in evaluation include ease, timing, and costs of collection; privacy considerations; credibility; comparability with other available data; amenability to statistical treatment and analysis; potential impact; and the ingenuity and skill of evaluation designers and data gatherers. Inevitably, there are tradeoffs between such considerations as the ease and economy of collecting softer data of the Personal Judgment type and generating "hard" Monetary data, or Performance data, which might have higher impact on certain audiences.

IV. SUMMARY AND RECOMMENDATIONS

As an "instrumental" contribution to answering the research question "What particular outcomes are appropriate for use as criteria to evaluate vocational education programs?" this paper has attempted to identify and clarify some key concepts and issues related to educational outcomes. Three additional products were completed during the first year of the National Center's study of vocational education outcomes and are recommended as companion references: (1) Vocational Education Outcomes: An Evaluative Bibliography of Empirical Studies; (2) Vocational Education Outcomes: A Thesaurus of Questions; (3) Vocational Education Outcomes: Annotated Bibliography of Related Literature. It is hoped that these products will help stimulate further conceptual and empirical work in the field and prove useful as points of reference for future commentary and reporting.

A. Summary

Vocational education outcomes were defined in this paper as "the consequences of vocational programs." Figure 3 depicted the range and diversity of possible outcomes associated with high school, post-secondary, and adult vocational education programs. It was emphasized that educational outcomes are not limited simply to the goals, objectives, and benefits of vocational programs but also include unintended consequences ("side effects") which may be evaluated in positive or negative terms. Expanded awareness of the range and diversity of possible outcomes can help offset narrrow perceptions that inhibit research, evaluation, program implementation, and policy making. Table I listed 30 vocational education outcome questions, illustrating such diverse themes as the acquisition of knowledge and occupational skills, economic development, employment, earnings, leadership development, student and parental satisfaction with schooling, educational and occupational discrimination, job satisfaction, personal self-image, occupational mobility, work-related attitudes, career planning, job-search skills, employment opportunities for women, and economic returns to schooling. Some of the outcomes identified in these questions apply to individual students while others are more broadly societal in nature.

An analytical framework for evaluation was suggested in Figure 2 based on an educational production function and similar to the familiar CIPP model (Context, Input, Process, and Product). Figure 1 identified six components of the education enterprise: Student Characteristics, Context, Resources, Goals, Processes, and Outcomes. It was suggested that vocational education can be evaluated not only on the basis of what comes out of the system--educational products, outputs, effects, impact--but also in terms of what goes into the enterprise and how it functions. While outcomes are of great importance, it cannot be claimed that this is the only category of criteria relevant for appraising the merit of vocational education. And within the outcomes category, one must resist the temptation to look only at one or two particular outcomes while ignoring all the other consequences of vocational programs. In order to evaluate vocational education in a balanced and meaningful way, evaluators should avoid putting all of their eggs in one narrow basket. Figures 1 and 2 were intended to provide perspective and focus attention on outcomes.

Figure 4 distinguished among educational outcomes (changes in empirical phenomena), outcome statements (verbal expressions), and outcome measures (observable indicators). This methodological framework recognized the need for evaluation

standards in order to carry systematic inquiry beyond description and research into the sphere of evaluation proper. Figure 4 also listed four potential areas in which evaluation findings might be applied--policy, program design, program management, and accountability--whether for program improvement or other purposes. The importance of formulating outcome statements explicitly and unambiguously was emphasized both for clarity of thinking and communication. An outcome statement or question typically identifies an educational treatment, affected entity, and specific outcome as well as the agency through which the treatment is delivered. An outcome statement may also identify a time framework and rationale for the stated outcome.

Among the key issues identified in the area of outcomes evaluation were the definition of vocational education, the specification of vocational programs as educational treatments (see Figure 5), sources and uses of evaluative criteria, experimental controls, and the use of comparison groups in evaluating vocational education programs with respect to specified outcomes. Table II distinguished five types of data used in outcomes evaluation, classified according to the nature of the observation and methods of data collection. A review of outcome studies disclosed heavier use of Status (Nonmonetary) and Personal Judgment data as opposed to Monetary, Ascriptive, and Performance data, with corresponding implications for generalizability, credibility, and impact on potential adudiences.

B. Suggested Agenda for Improving Outcomes Evaluation

Along with others, we find that empirical research has not documented a substantial body of knowledge concerning the outcomes of vocational education. Additional evaluation studies which repeat shortcomings of design and methodology that have been noted will not add significantly to our accumulation of knowledge. Some new initiatives are necessary to improve the art of outcomes evaluation.

We therefore recommend the formulation of a research, development, and evaluation (RD&E) agenda, aimed at producing clear, accurate, relevant, credible, and communicable findings. Salient features of such an agenda would be conceptual and empirical answers to such questions as:

(1) What is vocational education?

(2) Who are vocational students?

(3) What are the outcome goals of vocational education?

(4) What outcomes should be used as criteria to evaluate vocational education, and why?[32]

(5) What data are needed to describe and assess the effects of vocational education from the national as well as state and local perspectives, and how can such data best be collected and analyzed?

(6) What standards should be applied to particular outcome measures for purposes of evaluation, and how should they be determined?

(7) What specific "input" variables (under the headings of Student Characteristics, Educational and Social Context, Resources, Goals, and Processes) in the vocational education enterprise are significantly associated with particular Outcomes, and how are they functionally related?

(8) To what extent do extraneous forces and error factors inhibit the production of knowledge concerning "the correlates" of particular vocational education outcomes?

(9) What evaluation methods and procedures should be used to produce accurate and credible generalizations at the national level regarding the outcomes of vocational education?

(10) How can evaluation findings on vocational education outcomes best be communicated to relevant audiences, including policy makers, practitioners, and other evaluators to assure that such findings will be applied in the interests of improved educational effectiveness and efficiency?

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[32]This is the research question currently being addressed in the study to which this essay contributes. We feel that in its first year, this multi-year project progressed about 35%-45% of the way toward developing some meaningful and useful answers to the question. During Year Two (February 1979 to February 1980), attention will be focused on approximately six to eight specific outcomes--designing operational procedures and determining the extent to which the selected outcomes and procedures are regarded by relevant audiences as appropriate for use in evaluating vocational programs.

The conceptual and empirical answers prescribed for these questions must be meaningful and well documented so they can serve as a basis for developing authoritative, widely shared definitions and standards. Where value criteria are lacking and where empirical evidence is incomplete and conceptualizations imprecise, deficiencies should be openly acknowledged and a cogent rationale provided to justify whatever course of action is adopted as an expedient in light of the specified rational-empirical-normative gaps.

Action on the recommended RD&E agenda requires a willingness to acknowledge--with neither defensiveness nor resignation--existing shortcomings as well as the strengths of vocational education, both with respect to program performance and the knowledge we possess about the system's components and impact. And the "high tolerance for ambiguity" that is sometimes counseled for vocational education researchers and evaluators needs to be challenged in the interests of better evaluation and vocational education's commitment to high quality and responsiveness to the needs of individuals and society.

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For Further Information

For information concerning the above publications and the vocational education outcomes project, please contact:

Program Information Office
The National Center for Research
in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210
(614) 486-3655